

Appl. No. 10/774,551
Amdt. Dated June 27, 2005
Reply to Office Action of March 25, 2005

Attorney Docket No. 81716.0120
Customer No.: 26021

REMARKS/ARGUMENTS

Claim 9 is amended. New claims 16-21 are added. Support for new claims 18-21 can be found in original claims 12-15. Claims 9-21 are pending in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

Claims 9-11 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Inoue, U.S. Patent No. 4,816,322. Claim 9 is amended. Applicant respectfully traverses the rejection as to the amended claims.

Claim 9, as amended, is as follows:

A ceramic circuit board comprising:

a ceramic substrate having a through hole;
a metal column arranged within the through hole; and
metal circuit plates attached to both surfaces of the
ceramic substrate in such a way as to stop up the through hole,

wherein the metal circuit plates attached to both surfaces
of the ceramic substrate are connected to each other by the metal
column,

and wherein, between an inner wall surface of the
through hole and an outer wall surface of the metal column is secured
a space defining a cavity.

Applicant respectfully submits that Inoue cannot anticipate amended claim 9. Claim 9 is amended to clarify that the present invention requires that "between an inner wall surface of the through hole and an outer wall surface of the metal column is secured a space defining a cavity." The space that defines a cavity in present claim 9 offers the advantage that thermal expansion between the ceramic substrate and the metal column is accommodated. "Thus, even if, when heat is

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applied to the ceramic circuit board, the outer wall surface of the metal column is expanded and swollen due to the difference in the thermal expansion coefficient between the ceramic substrate and the metal column, the resultant expansion can be successfully accommodated by the space. This helps prevent the inner wall surface of the through hole from being pressed and expanded by the outer wall surface of the metal column, and thereby prevent occurrence of crack or fracture in the ceramic substrate. As a result, the ceramic circuit board can be operated normally and stably for a longer period of time." (Applicant's specification, at p. 12, lines 14-23).

Inoue is directed to a multilayer wiring substrate for packaging a plurality of electronic elements. (Inoue, 1:5-6). In Inoue, as shown in Figure 1, Through-holes 20 of a diameter of 0.3 mm (millimeters) are bored a grid pattern to penetrate through the substrate 1 from its upper surface to its lower surface. (Inoue, at 2:5-9) Wall surfaces 20a of the section 1 to define through-holes 20 that are coated with polytetrafluoroethylene films 21. (Inoue, at 2:9-11) Through-hole wirings 22 made of copper are formed within spaces surrounded by the films 21. (Inoue, at 2:11-13) Thus, although a space is also formed between an inner wall surface of a through hole 20 and an outer wall surface of a wiring 22, in Inoue, the space and is filled with a polytetrafluoroethylene films 21, as shown in Figures 1 and 2E of Inoue. On the other hand, in the present invention, the space is not filled with the film material, or any other material. Inoue does not disclose any structure in which the space defines a cavity as required by amended claim 9. In the present invention, the space between the metal column and the ceramic substrate defines a cavity, resulting the benefits discussed above.

In light of the foregoing, Applicant respectfully submits that Inoue cannot anticipate present claim 9 because, because Inoue does not teach or suggest each

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and every claim limitation. As such, withdrawal of the rejection and allowance of amended claim 9 is respectfully requested.

Claims 10 and 11 depend from claim 9 and cannot be anticipated for at least the same reasons as claim 9. Withdrawal of the rejection and allowance of claim 10 and 11 is thus respectfully requested.

New claims 16-21 depend from claim 9 and therefore cannot be anticipated for at least the same reasons as claim 9.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (213) 337-6700 to discuss the steps necessary for placing the application in condition for allowance.

If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,

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